INITIAL REVIEW OF NOTICEOF INTENTION TO COMMENCE LARGE MINING OPERATIONS

Western Clay Company
Bentonite Pits

M/041/0012
October 29, 2009

R647-4-104 - Operator's, Surface and Mineral Ownership

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
1	3	Legal description is incorrect. The third line should be SE 1/4 of section 35 vs. the NE 1/4 section.	lk	

R647-4-105 - Maps, Drawings & Photographs

105.3 - Drawings or Cross Sections (slopes, roads, pads, etc.)

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
2	Not Included	The NOI needs to include a long section and cross sections of each pit area, showing the extent of mining and the proposed final grade of the mined out area.	lk	

R647-4-106 - Operation Plan

106.3 - Estimated acreages disturbed, reclaimed, annually

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
3	6	The table showing the estimated acreage identifies a total of 57.5 acres, yet the maps identify 67.4 acres. These figures should be the same. It is likely that this table was not updated to reflect the proposed 10.4 acres that will be disturbed with the new pit.	lk	

106.5 - Existing soil types, location, amount

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
4	7	Please provide a copy of the NRCS soil survey descriptions for each soil type being affected by this operation. This material may be placed in an appendix with a reference to the appendix in the text.	lk	

R647-4-113 – Surety

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
5	15	The surety calculations provided cannot be verified (lack of information in the plan, such as the cross sections, to verify volumes for backfill and grading). The Division provided a spreadsheet via email for your use in developing the reclamation cost estimate. Please include this completed spreadsheet with your response to this review. Please make sure you document the various volumes, acres, etc., and include (or exclude as the case my be) the reclamation work completed on the North Pit, showing only the revegetation costs associated with that area. This action will effectively combine your recent partial bond release request with the approval of this amendment.	lk	

Ref. – R647-4-104

Replacement Page 3

5. **Location of Operation**:

County(ies) Sevier

Portions of N.E. 1/4, Section: 2 Township: T215 Range: R1W

Portions of N.E. 1/4, Section: 2 Township: T215 Range: R1W

Portions of S.E. 1/4, Section: 35 Township: T205 Range: R1W

The names of the surface and mineral owners for any areas which are to be impacted by mining must be provided to the Division. This list should include all private, state and federal ownership and the owners of lands immediately adjacent to the project areas.

6. **Ownership of the land surface** (circle all that apply):
(X)Private (Fee), Public Domain (BLM), National Forest (USFS), **(X)State of Utah (SITLA)** other:

Name: Western Clay Company Address: 620 East SR-24, Aurora, Utah 84620
Name: State of Utah Address:
Name: Address:
Name: Address:

7. **Owner(s) of record of the minerals to be mined** (circle all that apply):
(X)Private (Fee), Public Domain (BLM), National Forest (USFS), **(X)State of Utah (SITLA)** other:

Name: Western Clay Company Address: 620 East SR-24, Aurora, Utah 84620
Name: State of Utah Address:
Name: Address:
Name: Address:

8. **BLM Lease or Project File Number(s) and/or USFS Assigned Project Number(s):**

BLM Claim Numbers: Utah

State Lease Number(s): ML 1937

Name of Lessee(s): Western Clay Company

9. **Adjacent land owners:**

Name: Ken,Kirby,Lynn Nelson Address: 4150 N. 100 W. Redmond, Utah
Name: Gary & Susan Carlisle Address: 126 W. Main St. , Redmond, Utah
Name: Terrel & Rhea Nelson Address: 305 S. 100 E. Redmond, Utah

10. **Have the land, mineral and adjacent land owners been notified in writing?**
Yes X No

If no, why not?

11. **Does the Permittee / Operator have legal right to enter and conduct mining operations on the land covered by this notice?** Yes X No

Ref. - R647-4-106
106.3
Replacement Page 6

Note: Areas included in sections c & d will need to be referenced in the variance request section. Please shade or color code these areas on this map.

Additional maps and cross sections may be required in accordance with Rule R647-4-105.3. Design drawings and typical cross-sections for each tailings pond, sediment pond, or other major drainage control structures must also be included.

III. Rule R647-4-106 - Operation Plan

106.1 - Mineral(s) to be mined: Bentonite

106.2 - Type of Operation Conducted:

Describe the typical methods and procedures to be used in mining operations, on-site processing and concurrent reclamation. Include equipment descriptions where appropriate.

Typical Methods used to mine bentonite at our Redmond Mines include cleaning surface soils or contaminated surface bentonite off with front end loaders or crawler tractors. These materials are stockpiled for reclamation purposes Bentonite ore is then mined in sections with a track hoe. The track hoe mines 100 tons of material to create a raw pile to be tested for grade. A typical day of mining will produce from 5 to 20 100 ton piles. After grade is determined the crude piles are processed by spreading the bentonite out on a drying pad and running over it with a crawler tractor for size reduction and drying. The processed bentonite is placed in finished stock piles where it is loaded on belly dump trailers for transport to the plant. Reclamation is accomplished by filling in pits with over burden or low grade bentonite. High walls are sloped to reflect natural contours. Topsoil, reseeding and fertilization will follow.

106.3 - Estimated Acreage

Acreage listed here should match areas measured off the maps provided.

Areas of actual mining:	12.8 Acres
Overburden/waste dumps:	4.16 Acres
Ore and product stockpiles:	11.9 Acres
Access/haul roads:	1.1 Acres
Associated on-site processing facilities:	NA
Tailings disposal:	NA
Other - Please describe: (Topsoil)	2.66 Acres
Other – Please describe: (Ongoing Reclamation)	9.8 Acres
Other – Please describe: (Undisturbed Acreage)	25.48 Acres
Total Acreage:	67.9 Acres

106.4 - Nature of material including waste rock/overburden and estimated tonnage

Describe the typical annual amount of the ore and waste rock/overburden to be generated, in cubic yards. Where does the waste material originate? What is the nature of the overburden/wastes (general chemistry/mineralogy and description of geologic origin)? Will it be in the form of fines or coarse material? What are the typical particle size and size fractions of the waste rock?

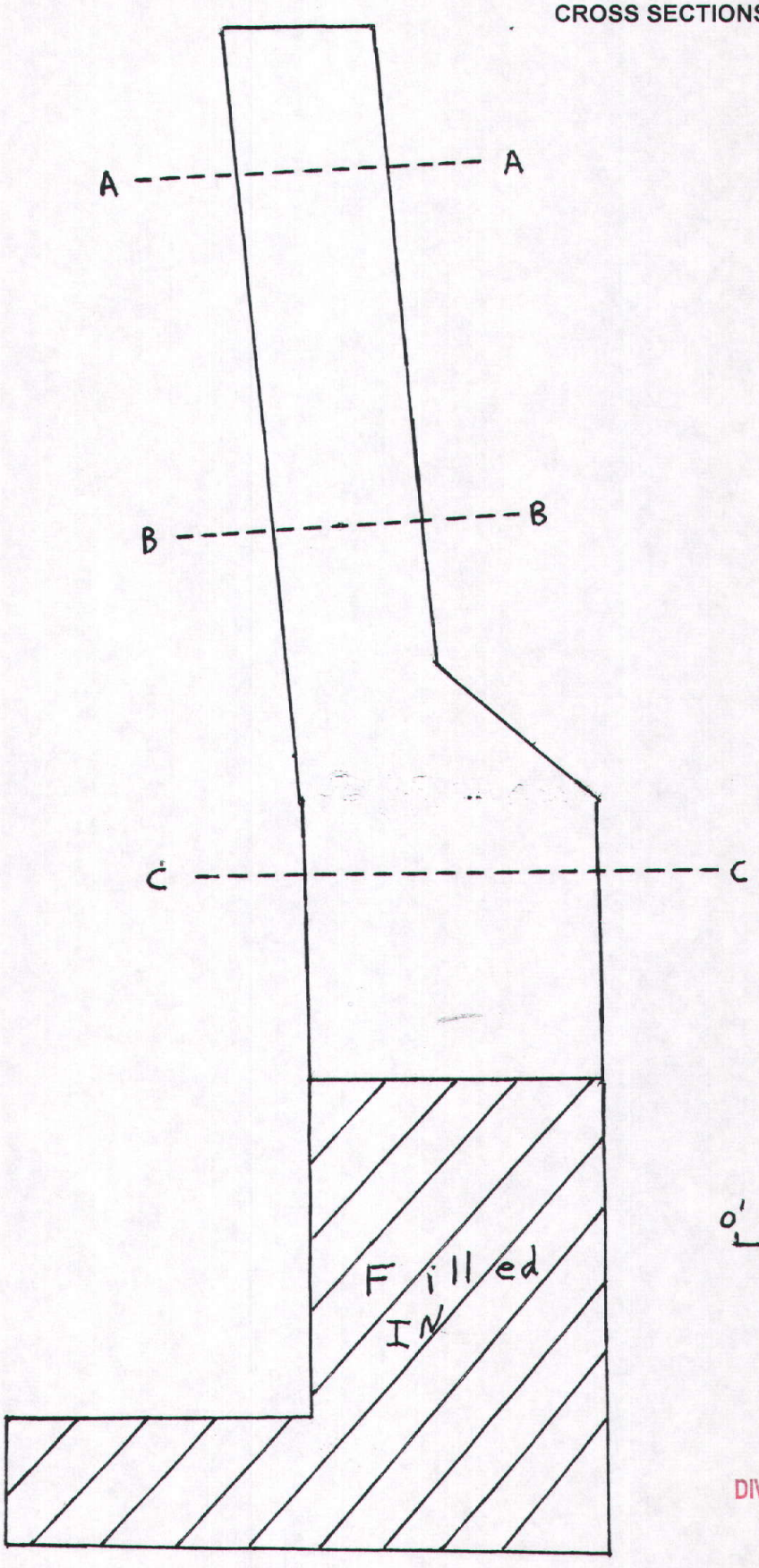
The waste material includes soil (topsoil), unconsolidated sand and gravel, low grade bentonite or mudstone and travertine. The waste materials occur as beds or massive parts of the deposit and are stratigraphically adjacent to the commercial bentonite beds. Fine surface sand originated from weathered sandy bentonite after colloidal bentonite was transported away through water erosion. Coarse sand and gravel seams were deposited from fluvial stream action. The bentonite beds of all grades originated from volcanic ash generated from the Marysville area about 25 million years ago. The ash was subsequently altered to sodium bentonite through warm spring activity. Sodium is the dominate cation of the bentonite and was derived from and on laying salt deposits of Jurassic Age. This type of bentonite (sodium smectite) has very high swelling characteristics which makes it useful for drilling and engineering purposes. The travertine deposits were also deposited through warm spring activity and consist of nearly pure calcium carbonate. The sand and bentonite cemented sandstone at our mine is predominantly quartz with lesser amounts of feldspar and magnetite. Our mines are located around the flanks of several salt diapers which forced the bentonite beds to the surface. This diaperism created very complex geological structures. The bentonite beds have angles of dip from 45 to 90 degrees. There are also numerous faults and movements of plastic beds. Overburden and waste materials at our mine is for the most part fine grained clay, silt and sand. There is also some larger rocky material (cobbles to boulder size) which consists of travertine, sand stone and solid volcanic ash.

Ref. – R647-4-105
105.3

Mine Pit Areas
and Cross Sections

NORTH SLOPE
CURRENT STATUS
10/14/09

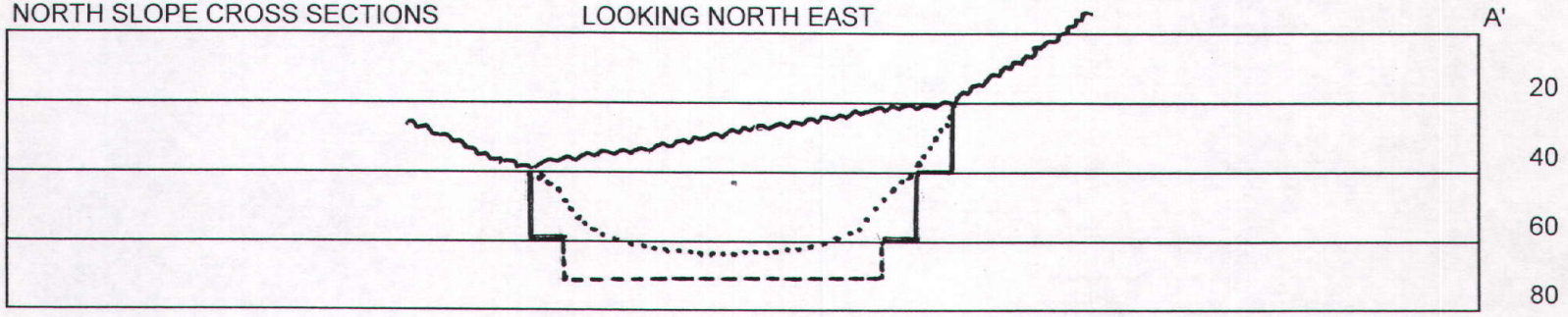
CURRENT MINE AREA
PROPOSED MINE AREA
CROSS SECTIONS



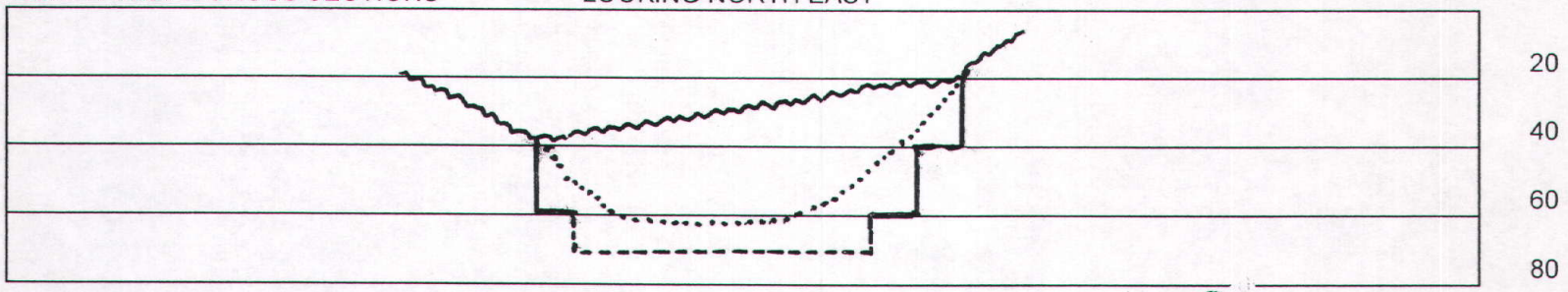
10/14/09
NORTH SLOPE CROSS SECTIONS

CURRENT MINE PROFILE
PROPOSED MINE PROFILE
PROPOSED RECLAMATION
NATURAL CONTOUR

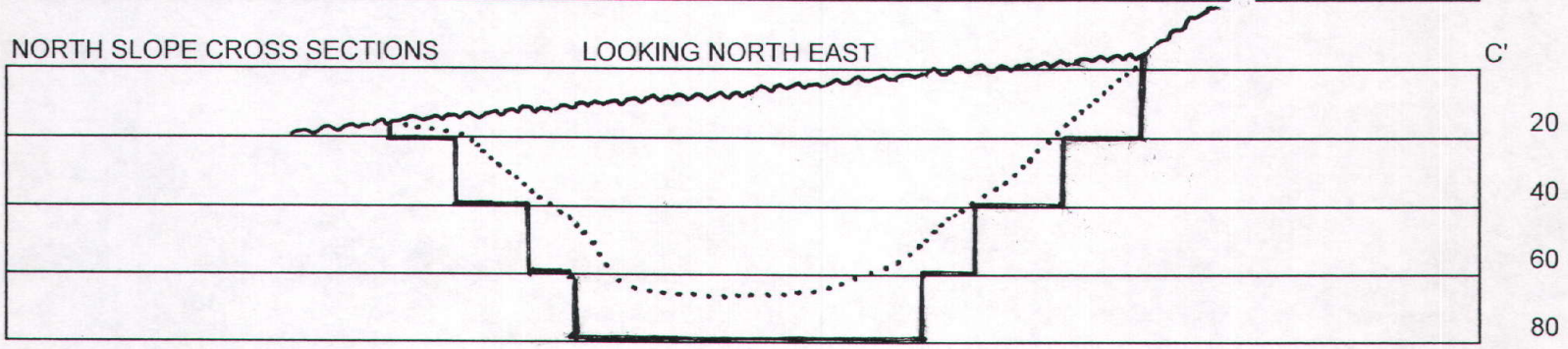
NORTH SLOPE CROSS SECTIONS LOOKING NORTH EAST A'

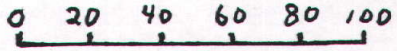


NORTH SLOPE CROSS SECTIONS LOOKING NORTH EAST



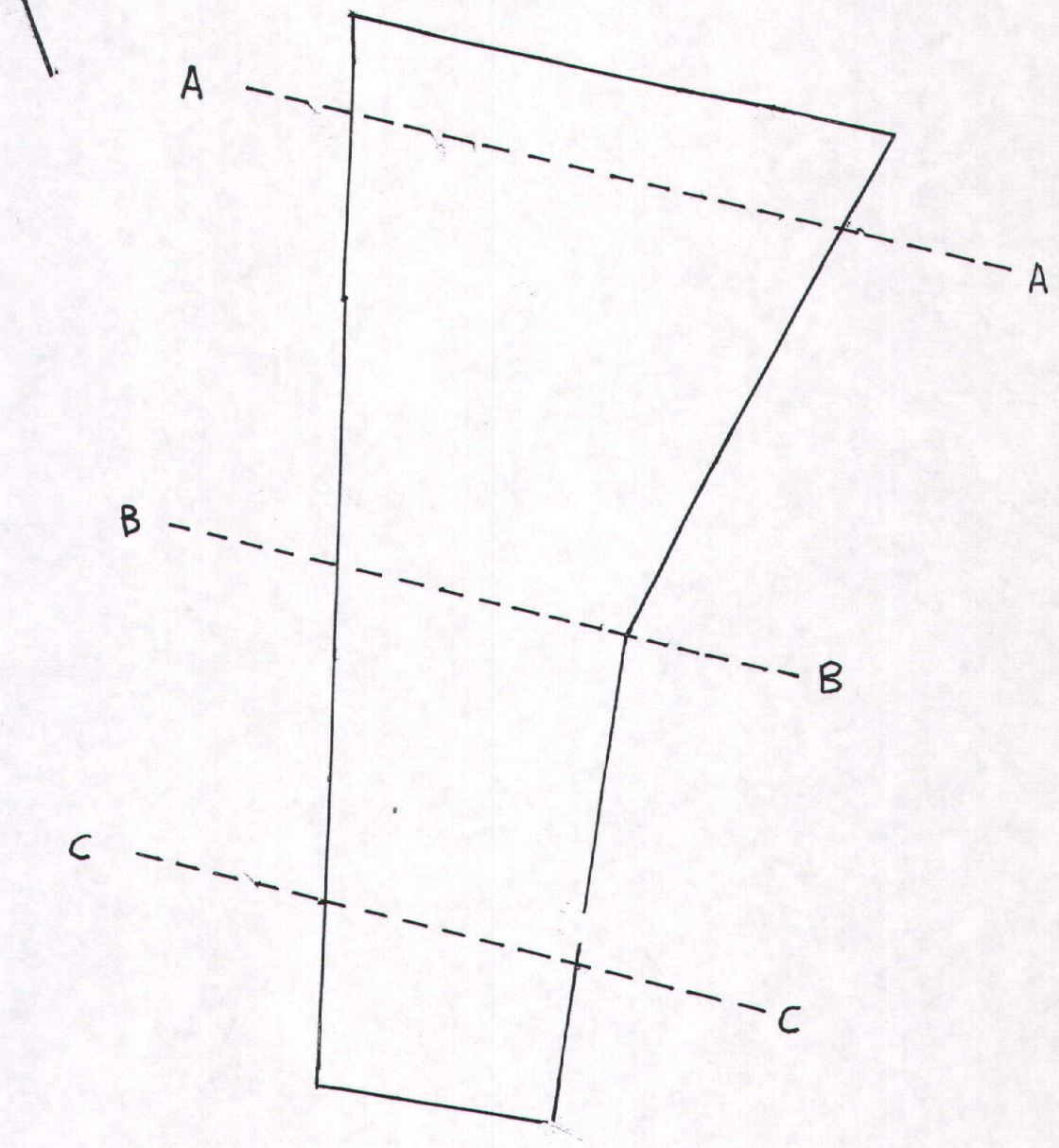
NORTH SLOPE CROSS SECTIONS LOOKING NORTH EAST C'





SHEEP TRAIL FLAT
CURRENT STATUS
10/14/09

CURRENT MINE AREA
PROPOSED MINE AREA
CROSS SECTIONS



0' 50' 100 150' 200'

10/14/09

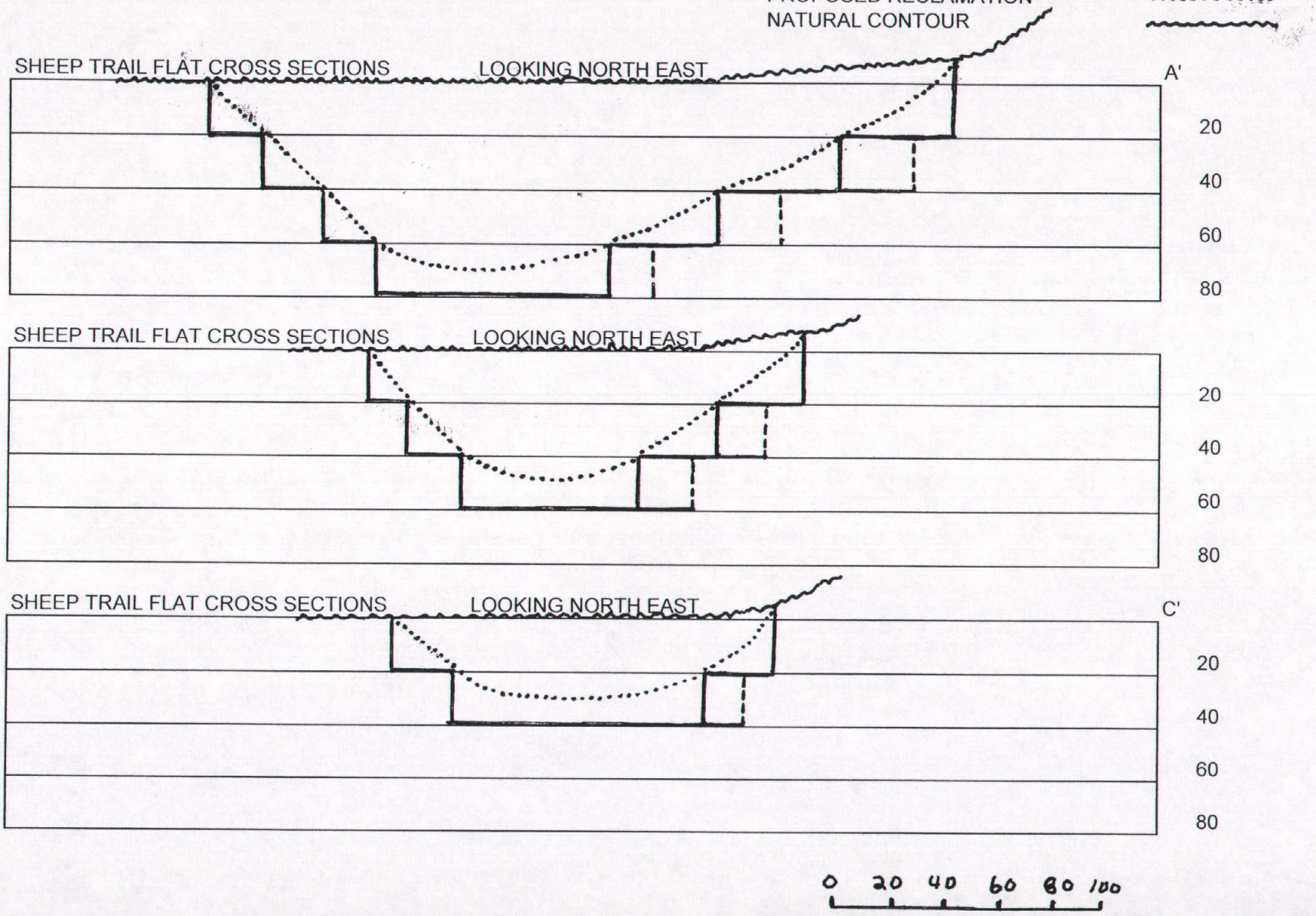
SHEEP TRAIL FLAT CROSS SECTIONS

CURRENT MINE PROFILE

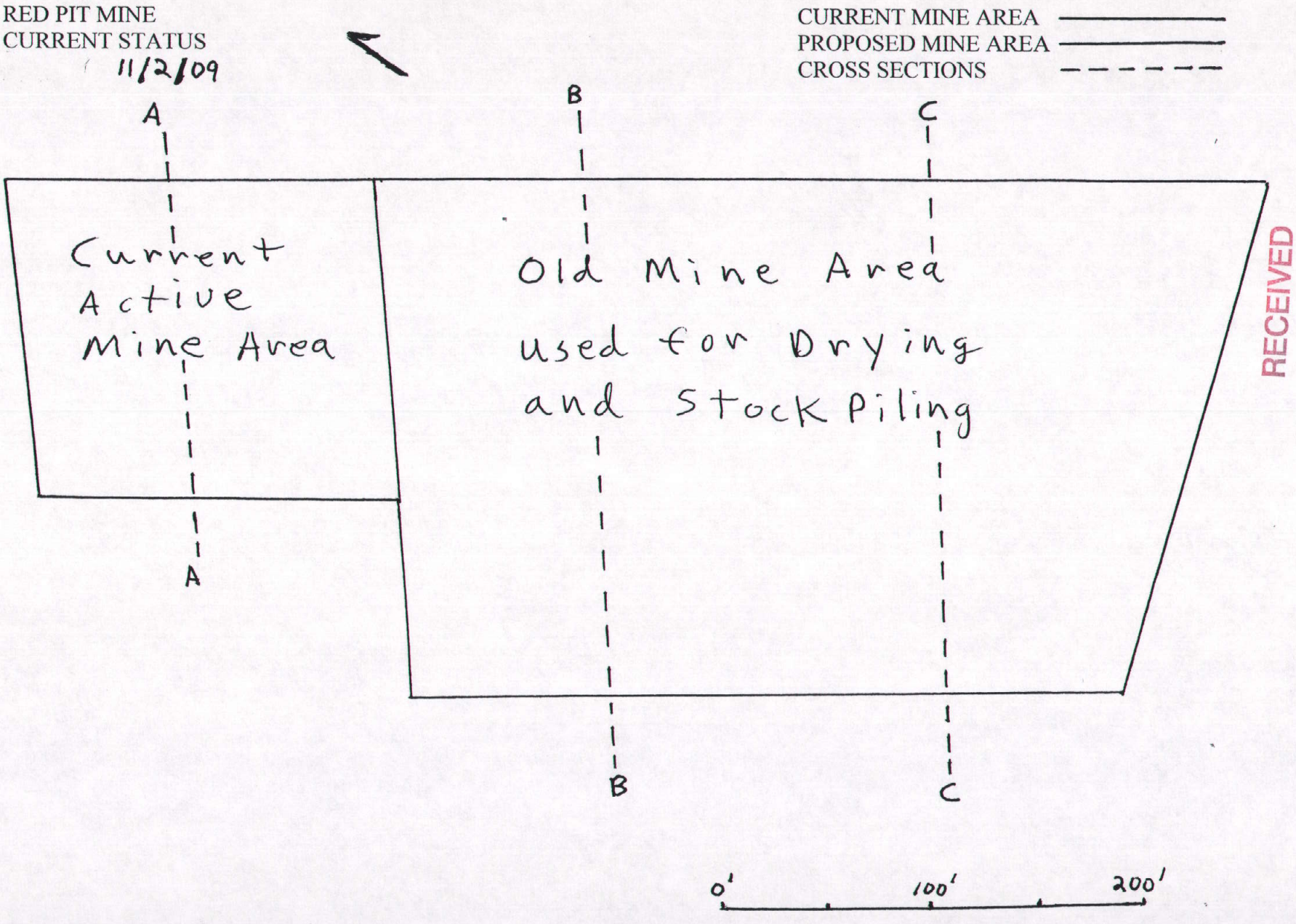
PROPOSED MINE PROFILE

PROPOSED RECLAMATION

NATURAL CONTOUR



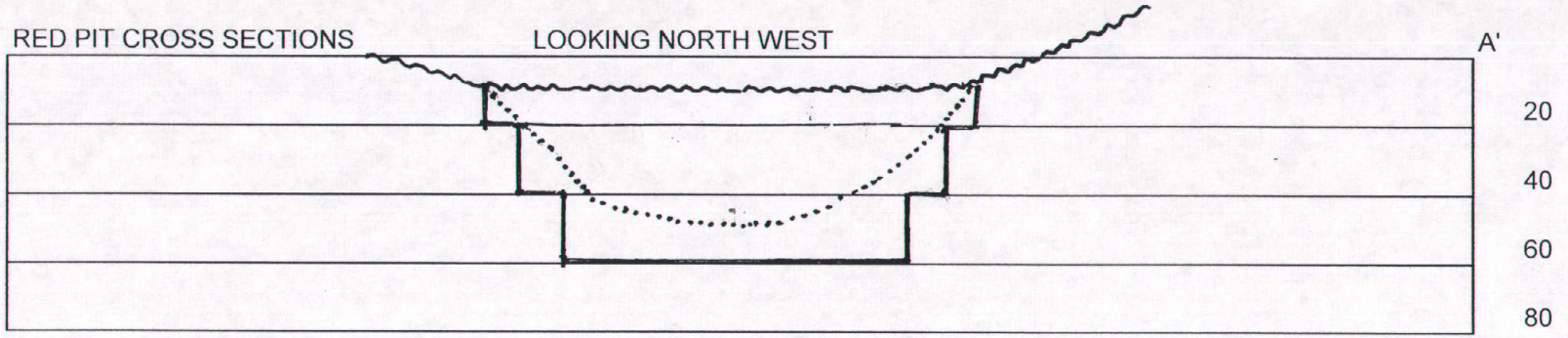
RED PIT MINE
CURRENT STATUS
11/2/09



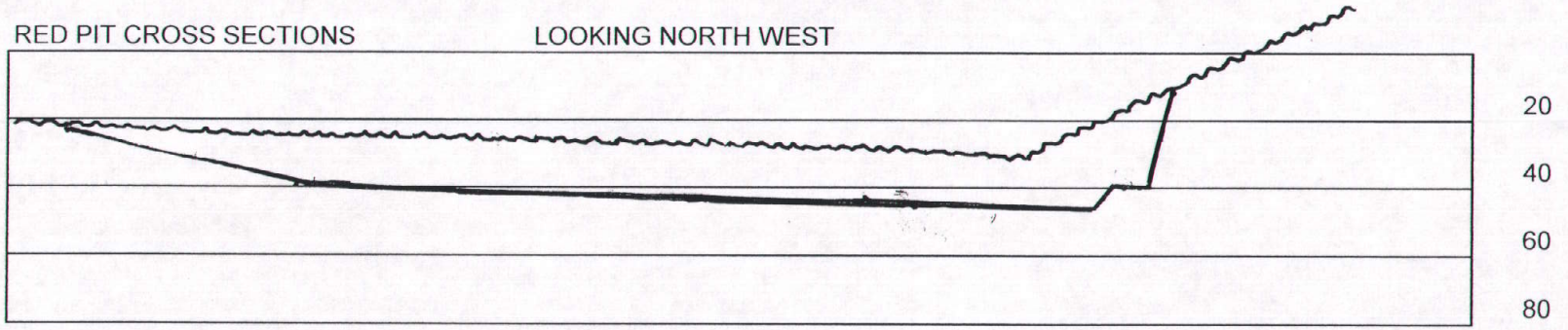
10/14/09
RED PIT CROSS SECTIONS

CURRENT MINE PROFILE
PROPOSED MINE PROFILE
PROPOSED RECLAMATION
NATURAL CONTOUR

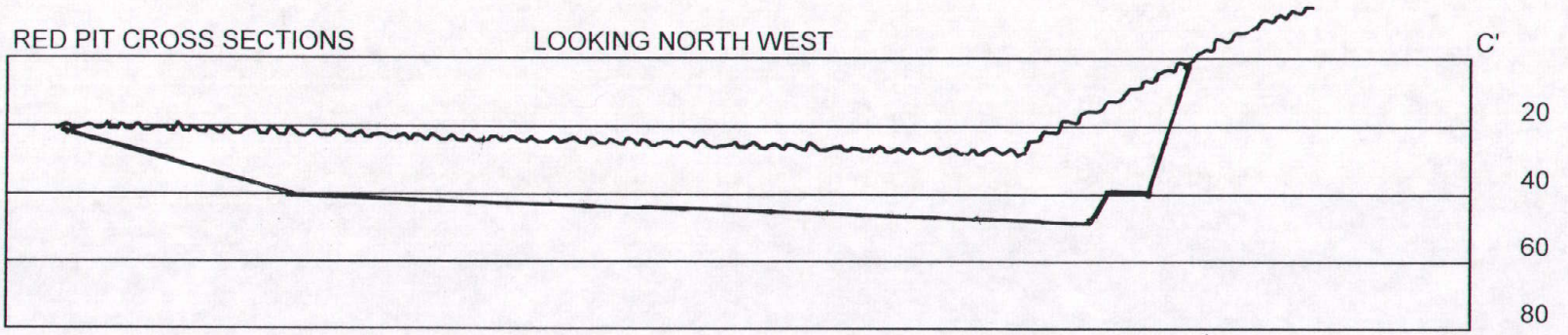
RED PIT CROSS SECTIONS LOOKING NORTH WEST A'



RED PIT CROSS SECTIONS LOOKING NORTH WEST



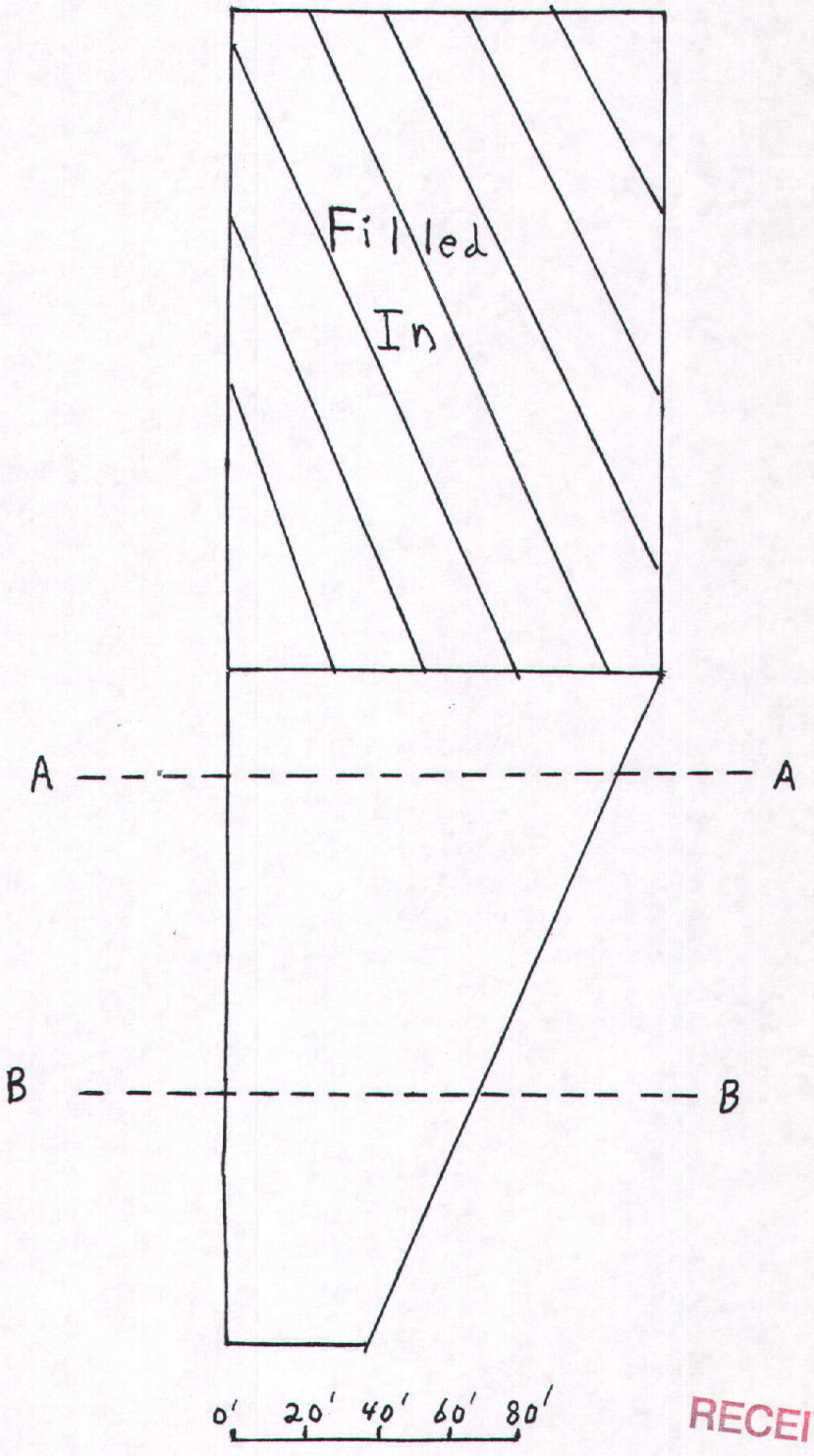
RED PIT CROSS SECTIONS LOOKING NORTH WEST C'



0 20 40 60 80 100

SHEEP TRAIL SOUTH
CURRENT STATUS
10/14/09

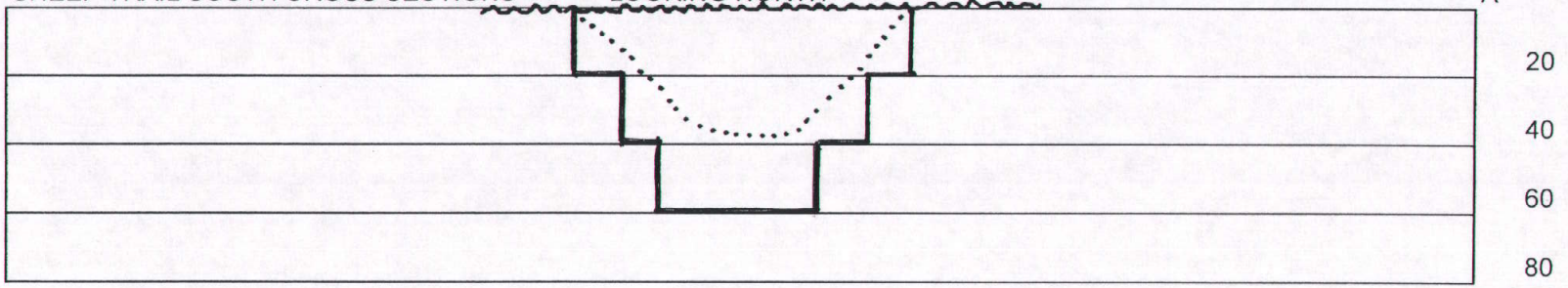
CURRENT MINE AREA
PROPOSED MINE AREA
CROSS SECTIONS



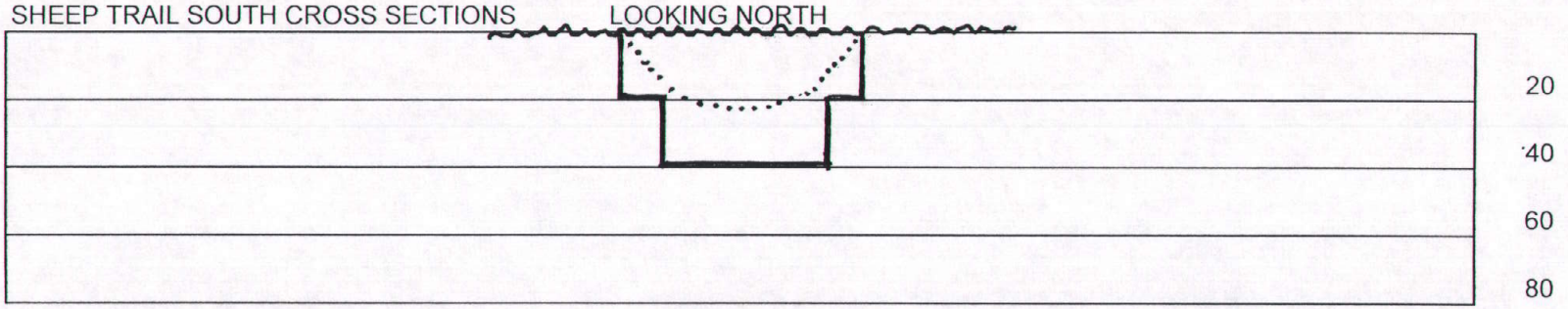
10/14/09
SHEEP TRAIL SOUTH CROSS SECTIONS

CURRENT MINE PROFILE
PROPOSED MINE PROFILE
PROPOSED RECLAMATION
NATURAL CONTOUR

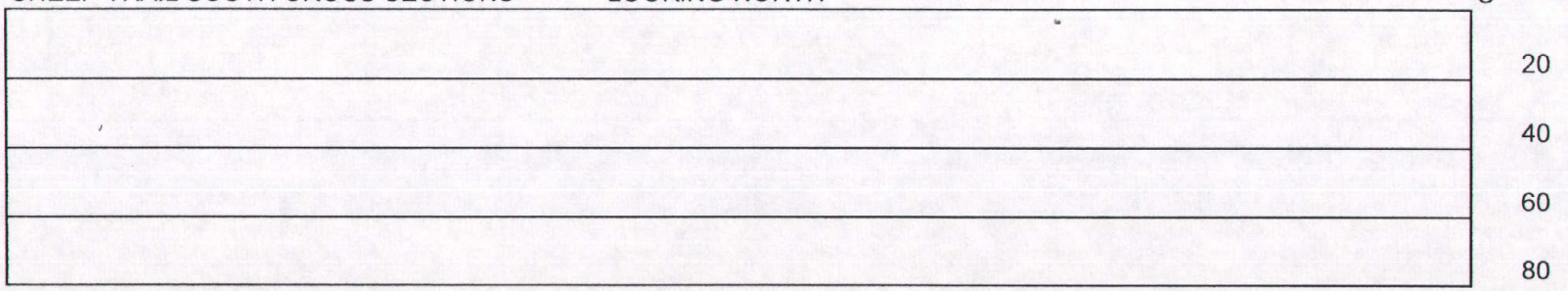
SHEEP TRAIL SOUTH CROSS SECTIONS LOOKING NORTH A'



SHEEP TRAIL SOUTH CROSS SECTIONS LOOKING NORTH



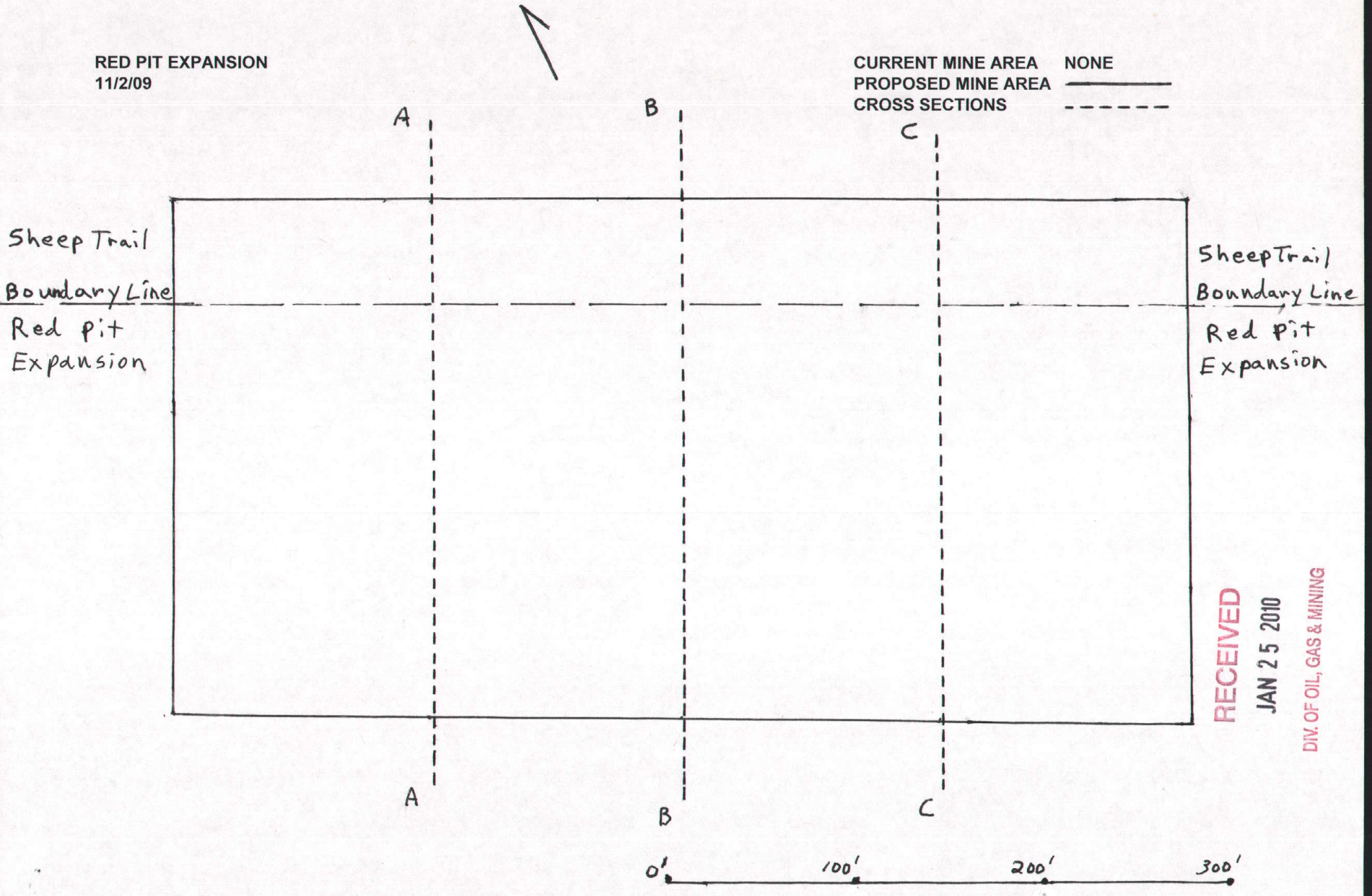
SHEEP TRAIL SOUTH CROSS SECTIONS LOOKING NORTH C'



0 20 40 60 80

RED PIT EXPANSION
11/2/09

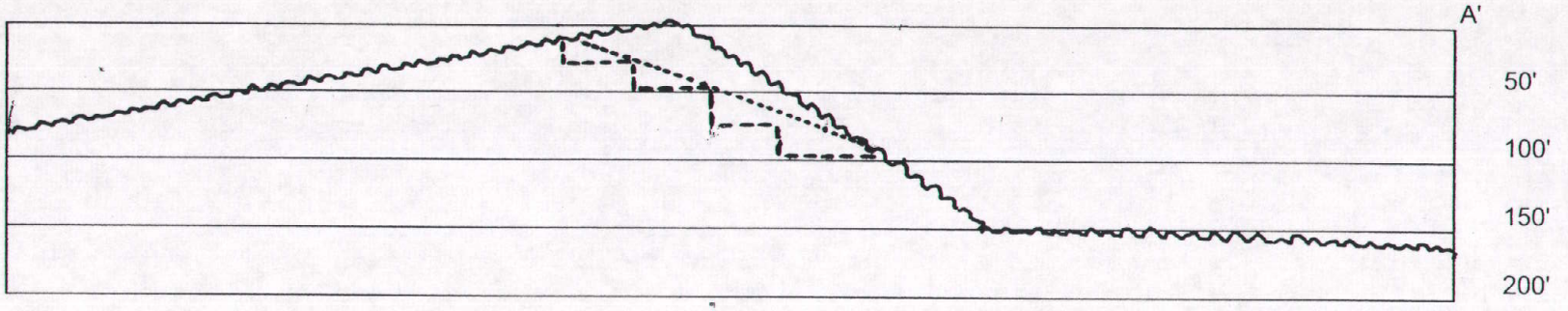
CURRENT MINE AREA NONE
PROPOSED MINE AREA ——————
CROSS SECTIONS - - - - - -



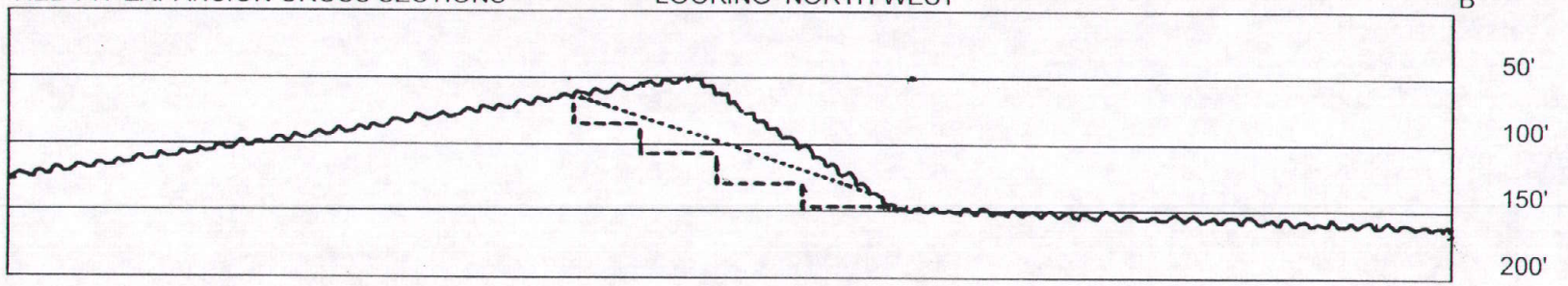
11/2/09

CURRENT MINE PROFILE NONE
PROPOSED MINE PROFILE
PROPOSED RECLAMATION
NATURAL CONTOUR

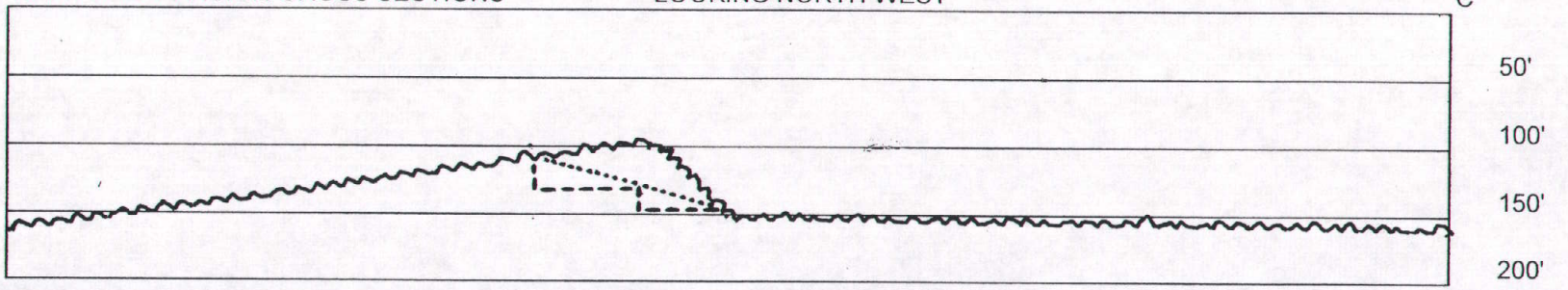
RED PIT EXPANSION CROSS SECTIONS LOOKING NORTH WEST



RED PIT EXPANSION CROSS SECTIONS LOOKING NORTH WEST

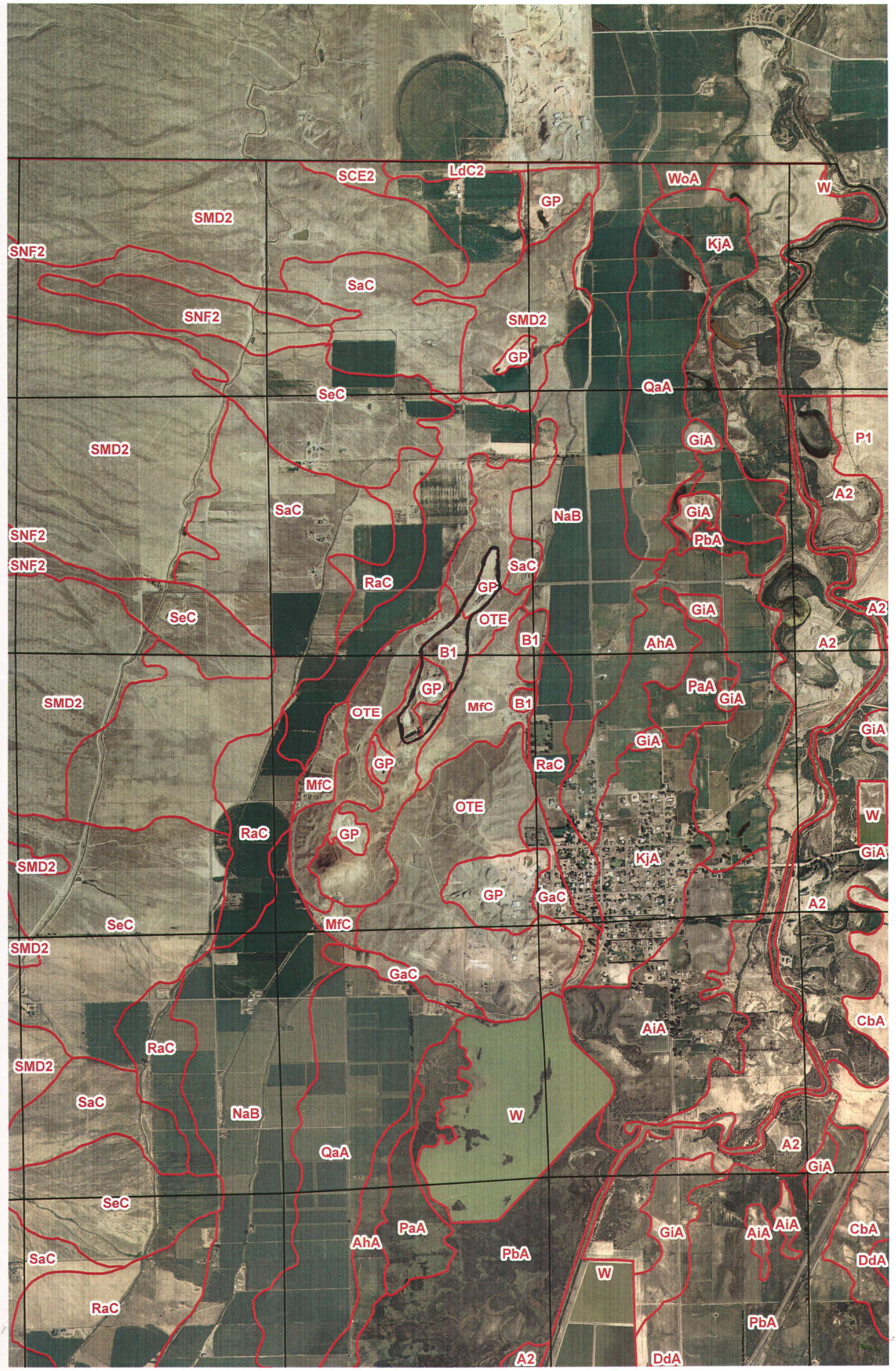


RED PIT EXPANSION CROSS SECTIONS LOOKING NORTH WEST



0' 50' 100' 150' 200'

Red Pit Expansion
Surface Facility Map


SCE2
LdC2
WoA
W
GP
SMD2
KjA
SNF2
SaC
SNF2
SMD2
GP
QaA
SeC
SMD2
GiA
P1
SaC
NaB
GiA
A2
SNF2
PbA
SNF2
SaC
RaC
GP
GiA
A2
SeC
OTE
B1
AhA
A2
B1
GP
PaA
SMD2
GiA
MfC
B1
OTE
GiA
GiA
GP
RaC
MfC
OTE
W
RaC
GP
KjA
SMD2
GP
GaC
A2
SeC
MfC
SMD2
GaC
CbA
AiA
RaC
SMD2
SaC
NaB
W
QaA
A2
GiA
SeC
PaA
AiA
AiA
CbA
GiA
AhA
SaC
PbA
DdA
W
RaC
PbA
A2
DdA

GP--Pits

Composition

- Pits: 100 percent of the unit

Setting

Landform(s):
Elevation:
Precipitation:
Slope gradient:
Air temperature:
Frost-free period:

Characteristics of Pits

Average total avail. water in top 5 feet (in.):
Available water capacity class: NA
Parent material:
Restrictive feature(s):
Depth to Water table:
Drainage class:
Flooding hazard:
Ponding hazard:
Soil loss tolerance (T factor):
Wind erodibility group (WEG):
Wind erodibility index (WEI):
Land capability class, irrigated:
Land capability class, nonirrigated:
Hydric soil: unrank
Hydrologic group:
Runoff class:
Potential frost action:
Farm Class: Not prime farmland

Saturated hydraulic conductivity class: NA

Ecological class(es):

OTE--Tosser-Hiko Peak-Annabella complex, 5 to 40 percent slopes

Composition

- Tosser and similar soils: 45 percent of the unit
- Hiko Peak and similar soils: 25 percent of the unit
- Annabella and similar soils: 20 percent of the unit
- Escalante and similar soils: 10 percent of the unit

Setting

Landform(s): intermontane basins, stream terraces
Elevation: 5118 to 5889 feet
Precipitation: 8 to 12 inches
Slope gradient: 8 to 40 percent
Air temperature: 46 to 51 °F
Frost-free period: 100 to 140 days

Characteristics of Tosser and similar soils

Average total avail. water in top 5 feet (in.): 2.7
Available water capacity class: Very low
Parent material: colluvium and slope alluvium derived from igneous rocks, limestone and quartzite
Restrictive feature(s): none
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none

Saturated hydraulic conductivity class: High

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, irrigated:
Land capability class, nonirrigated:
Hydric soil: no
Hydrologic group: A
Runoff class:
Potential frost action: low
Farm Class: Not prime farmland

Brief Soil Descriptions (UT)

Sevier County Area, Utah

[OTE--Tosser-Hiko Peak-Annabella complex, 5 to 40 percent slopes]

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available water capacity (inches)	pH	Salinity (mmhos/cm)	SAR
A1 -- 0 to 4	Very gravelly sandy loam	0.2 to 0.4	7.4 to 9.0	0.0 to 2.0	0 to 2
A2 -- 4 to 10	Gravelly fine sandy loam	0.5 to 0.8	7.9 to 9.0	0.0 to 2.0	0 to 2
Bkq1 -- 10 to 23	Very gravelly loamy sand	0.4 to 0.6	7.9 to 9.0	0.0 to 4.0	5 to 10
Bkq2 -- 23 to 37	Extremely gravelly sand	0.3 to 0.7	7.9 to 9.0	0.0 to 4.0	5 to 10
Bkq3 -- 37 to 60	Very gravelly loamy sand	0.5 to 1.1	7.9 to 9.0	0.0 to 4.0	5 to 10

Ecological class(es): NRCS Rangeland Site - Semidesert Gravelly Loam (Wyoming Big Sagebrush) South

Characteristics of Hiko Peak and similar soils

Average total avail. water in top 5 feet (in.): 3.2

Available water capacity class: Low

Parent material: colluvium and slope alluvium derived from igneous rocks, limestone and quartzite

Restrictive feature(s): none

Depth to Water table: none within the soil profile

Drainage class: well drained

Flooding hazard: none

Ponding hazard: none

Saturated hydraulic conductivity class: High

Soil loss tolerance (T factor): 5

Wind erodibility group (WEG): 6

Wind erodibility index (WEI): 48

Land capability class, irrigated:

Land capability class, nonirrigated:

Hydric soil: no

Hydrologic group: A

Runoff class:

Potential frost action: moderate

Farm Class: Not prime farmland

[OTE--Tosser-Hiko Peak-Annabella complex, 5 to 40 percent slopes]

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available water capacity (inches)	pH	Salinity (mmhos/cm)	SAR
A -- 0 to 9	Very cobbly sandy loam	0.4 to 0.8	7.9 to 9.0	0.0 to 4.0	0
Bk -- 9 to 33	Very gravelly sandy loam	0.7 to 2.7	7.9 to 9.0	0.0 to 4.0	0 to 3
C -- 33 to 60	Very gravelly sandy loam	0.8 to 2.9	7.9 to 9.0	0.0 to 4.0	0 to 3

Ecological class(es): NRCS Rangeland Site - Semidesert Gravelly Loam (Wyoming Big Sagebrush) South

Characteristics of Annabella and similar soils

Average total avail. water in top 5 feet (in.): 3.6

Available water capacity class: Low

Parent material: colluvium and slope alluvium derived from igneous and sedimentary rock

Restrictive feature(s): none

Depth to Water table: none within the soil profile

Drainage class: somewhat excessively drained

Flooding hazard: none

Ponding hazard: none

Saturated hydraulic conductivity class: High

Soil loss tolerance (T factor): 5

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, irrigated:

Land capability class, nonirrigated:

Hydric soil: no

Hydrologic group: A

Runoff class:

Potential frost action: moderate

Farm Class: Not prime farmland

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available water capacity (inches)	pH	Salinity (mmhos/cm)	SAR
A -- 0 to 3	Very cobbly sandy loam	0.1 to 0.3	7.9 to 8.4	0.0 to 2.0	0 to 5
C -- 3 to 60	Very gravelly sandy loam	1.7 to 6.2	7.9 to 9.0	0.0 to 4.0	0 to 5

Ecological class(es): NRCS Rangeland Site - Semidesert Gravelly Loam (Wyoming Big Sagebrush) South

Brief Soil Descriptions (UT)

Sevier County Area, Utah

[Absence of an entry indicates that the feature is not a concern or that data were not estimated. Data applies to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

B1--Torriorthents-Haplogypsids association, 5 to 35 percent slopes

Composition

- Torriorthents, north, north aspects and similar soils: 40 percent of the unit
- Torriorthents, south, south aspects and similar soils: 30 percent of the unit
- Haplogypsids and similar soils: 15 percent of the unit
- Rock outcrop: 10 percent of the unit
- Badland: 5 percent of the unit

Setting

Landform(s): badlands, hills
Elevation: 5118 to 6844 feet
Precipitation: 8 to 16 inches
Slope gradient: 10 to 35 percent
Air temperature: 46 to 51 °F
Frost-free period: 100 to 140 days

Characteristics of Torriorthents, north, north aspects and similar soils

Average total avail. water in top 5 feet (in.): 4.6
Available water capacity class: Low
Parent material: gypsiferous slope alluvium over residuum weathered from gypsiferous shale
Restrictive feature(s): paralithic bedrock at 10 to 79 inches
lithic bedrock at 31 to 79 inches
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none
Saturated hydraulic conductivity class: Moderately Low
Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, irrigated:
Land capability class, nonirrigated: 7s
Hydric soil: no
Hydrologic group: C
Runoff class: very high
Potential frost action: moderate
Farm Class: Not prime farmland

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available water capacity (inches)	pH	Salinity (mmhos/cm)	SAR
A -- 0 to 13	Channery loam	1.3 to 1.9	7.9 to 8.4	0.0 to 2.0	0
C -- 13 to 37	Sandy clay loam	1.5 to 3.9	7.9 to 9.0	2.0 to 4.0	0 to 5
Cr -- 37 to 41	Weathered bedrock			Null	Null

Ecological class(es): NRCS Rangeland Site - Semidesert Loam (Wyoming Big Sagebrush)

Brief Soil Descriptions (UT)

Sevier County Area, Utah

[B1--Torriorthents-Haplogypsids association, 5 to 35 percent slopes]

Characteristics of Torriorthents, south, south aspects and similar soils

Average total avail. water in top 5 feet (in.): 1.4
Available water capacity class: Very low
Parent material: gypsiferous slope alluvium over residuum weathered from gypsiferous shale
Restrictive feature(s): paralithic bedrock at 2 to 10 inches
lithic bedrock at 10 to 20 inches
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none

Saturated hydraulic conductivity class: Moderately Low

Soil loss tolerance (T factor): 1
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, irrigated: 2c
Land capability class, nonirrigated: 6c
Hydric soil: no
Hydrologic group: D
Runoff class:
Potential frost action: low
Farm Class: Not prime farmland

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available water capacity (inches)	pH	Salinity (mmhos/cm)	SAR
C -- 0 to 20	Very channery silty clay	0.4 to 2.6	7.9 to 9.6	4.0 to	9 to 13
Cr -- 20 to 24	Weathered bedrock			Null	Null
R -- 24 to 28	Bedrock			Null	Null

Ecological class(es): NRCS Rangeland Site - Semidesert Shallow Gypsum (Shadscale)

Characteristics of Haplogypsids and similar soils

Average total avail. water in top 5 feet (in.): 4.4
Available water capacity class: Low
Parent material: gypsiferous slope alluvium over residuum weathered from gypsiferous shale
Restrictive feature(s): paralithic bedrock at 20 to 79 inches
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none

Saturated hydraulic conductivity class: Moderately Low

Soil loss tolerance (T factor): 5
Wind erodibility group (WEG): 4L
Wind erodibility index (WEI): 86
Land capability class, irrigated:
Land capability class, nonirrigated:
Hydric soil: no
Hydrologic group: C
Runoff class:
Potential frost action: moderate
Farm Class: Not prime farmland

Brief Soil Descriptions (UT)

Sevier County Area, Utah

[B1--Torriorthents-Haplogypsids association, 5 to 35 percent slopes]

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available water capacity (inches)	pH	Salinity (mmhos/cm)	SAR
A -- 0 to 2	Sandy clay loam	0.3 to 0.4	7.4 to 8.4	2.0 to 8.0	0 to 5
Bw -- 2 to 10	Clay	0.4 to 1.3	7.9 to 8.4	2.0 to 8.0	0 to 5
By -- 10 to 59	Very parachannery sandy clay loam	2.0 to 6.4	7.9 to 8.4	4.0 to	0 to 5
Cr -- 59 to 63	Weathered bedrock			Null	Null

Ecological class(es): NRCS Rangeland Site - Semidesert Silt Loam (Winterfat)

Chemical Soil Properties

Sevier County Area, Utah

[Absence of an entry indicates that data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*meq/100 g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
B1:								
Torriorthents, north, north aspects	0-13	10-19	---	7.9 - 8.4	15-30	0-3	0.0-2.0	0
	13-37	4.7-16	---	7.9 - 9.0	20-40	0-5	2.0-4.0	0-5
	37-41	---	---	---	---	---	---	---
Torriorthents, south, south aspects	0-20	17-33	---	7.9 - 9.6	5-30	1-5	4.0-20.0	9-13
	20-24	---	---	---	---	---	---	---
	24-28	---	---	---	---	---	---	---
Haplogypsids	0-2	8.4-20	---	7.4 - 8.4	10-30	5-10	2.0-8.0	0-5
	2-10	4.6-25	---	7.9 - 8.4	10-30	5-10	2.0-8.0	0-5
	10-59	2.0-13	---	7.9 - 8.4	20-40	10-20	4.0-16.0	0-5
	59-63	---	---	---	---	---	---	---
GaC:								
Medburn	0-8	4.8-13	---	7.9 - 8.6	3-40	0	2.0-4.0	0-5
	8-60	4.1-15	---	7.9 - 8.6	3-40	0	2.0-4.0	0-5
Glenwood	0-5	7.3-16	---	7.4 - 8.4	1-15	0	2.0-4.0	0-5
	5-19	7.0-14	---	7.4 - 8.4	1-15	0	2.0-4.0	0-5
	19-26	0.0-11	---	7.9 - 8.4	1-15	0	2.0-4.0	0-5
	26-60	0.0-8.5	---	7.9 - 8.4	1-5	0	2.0-4.0	0-5
GP:								
Pits	---	---	---	---	---	---	---	---
MfC:								
Mellor, slightly saline	0-7	17-22	---	7.9 - 9.0	5-15	0	2.0-8.0	5-13
	7-16	21-28	---	9.0 - 11.0	10-20	0-2	8.0-32.0	13-40
	16-40	21-35	---	9.0 - 11.0	15-30	0-2	16.0-32.0	13-40
	40-60	11-21	---	9.0 - 11.0	15-30	0-2	16.0-32.0	13-40
NaB:								
Naser	0-10	11-22	---	7.9 - 8.6	40-60	0-2	0.0-4.0	1-5
	10-60	4.7-18	---	7.9 - 8.6	40-60	0-2	0.0-4.0	1-5
OTE:								
Tosser	0-4	4.0-13	---	7.4 - 9.0	3-15	0-2	0.0-2.0	0-2
	4-10	5.0-12	---	7.9 - 9.0	3-15	0-2	0.0-2.0	0-2
	10-23	2.0-4.0	---	7.9 - 9.0	15-30	0-2	0.0-4.0	5-10
	23-37	2.0-4.0	---	7.9 - 9.0	15-30	0-2	0.0-4.0	5-10
	37-60	2.0-4.0	---	7.9 - 9.0	15-30	0-2	0.0-4.0	5-10
Hiko Peak	0-9	5.4-9.8	---	7.9 - 9.0	3-30	0	0.0-4.0	0
	9-33	2.7-9.7	---	7.9 - 9.0	15-40	0	0.0-4.0	0-3
	33-60	2.6-9.6	---	7.9 - 9.0	3-30	0	0.0-4.0	0-3

Chemical Soil Properties

Sevier County Area, Utah

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*meq/100 g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
OTE:								
Annabella	0-3	6.4-17	---	7.9 - 8.4	5-15	0	0.0-2.0	0-5
	3-60	5.5-16	---	7.9 - 9.0	5-15	0-5	0.0-4.0	0-5
RaC:								
Rapho	0-4	8.1-21	---	7.9 - 9.0	15-40	0-2	0.0-2.0	0-5
	4-59	5.6-13	---	7.9 - 9.0	40-60	0-2	0.0-2.0	0-5
Naser	0-10	11-22	---	7.9 - 9.0	40-60	0-2	0.0-4.0	1-5
	10-60	4.7-18	---	7.9 - 9.0	40-60	0-2	0.0-4.0	1-5
SaC:								
Sanpete	0-11	8.1-17	---	7.9 - 9.0	15-20	0	0.0-2.0	0
	11-47	6.8-18	---	7.9 - 9.0	40-70	0-2	0.0-2.0	0-5
	47-59	1.6-11	---	7.9 - 9.0	30-70	0-2	0.0-2.0	0-5
Lisade	0-5	9.2-16	---	7.9 - 9.0	20-50	0	0.0-2.0	0-1
	5-22	2.9-13	---	7.9 - 9.0	40-60	0	0.0-2.0	0-2
	22-34	3.4-13	---	7.9 - 9.0	40-60	0-2	2.0-4.0	2-13
	34-66	3.4-13	---	7.9 - 9.0	20-40	0-2	2.0-4.0	2-20
SeC:								
Sigurd	0-12	9.4-16	---	7.9 - 8.4	15-40	0-1	0.0-2.0	0-5
	12-49	3.4-13	---	7.9 - 9.0	40-60	0-1	0.0-2.0	0-10
Rapho	0-4	8.1-17	---	7.9 - 9.0	15-40	0-2	0.0-2.0	0-5
	4-59	5.6-13	---	7.9 - 9.0	40-60	0-2	0.0-2.0	0-5
SMD2:								
Sanpete	0-11	8.1-17	---	7.9 - 9.0	15-20	0	0.0-2.0	0
	11-47	6.8-18	---	7.9 - 9.0	40-70	0-2	0.0-2.0	0-5
	47-59	1.6-11	---	7.9 - 9.0	30-70	0-2	0.0-2.0	0-5
Lisade	0-5	9.2-16	---	7.9 - 9.0	20-50	0	0.0-2.0	0-1
	5-22	2.9-13	---	7.9 - 9.0	40-60	0	0.0-2.0	0-2
	22-34	3.4-13	---	7.9 - 9.0	40-60	0-2	2.0-4.0	2-13
	34-66	3.4-13	---	7.9 - 9.0	20-40	0-2	2.0-4.0	2-20

Physical Soil Properties

Sevier County Area, Utah

[Entries under "Erosion Factors--T" apply to the entire profile. Entries under "Wind Erodibility Group" and "Wind Erodibility Index" apply only to the surface layer. Absence of an entry indicates that data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
B1:														
Torriorthents, north, north aspects	0-13	---	---	15-27	1.20-1.40	4.23-14.11	0.10-0.15	0.0-2.9	0.3-1.0	.24	.37	3	5	56
	13-37	---	---	15-35	1.25-1.40	1.40-14.11	0.06-0.16	0.0-5.9	0.0-0.5	.24	.24			
	37-41	---	---	---	---	0.00-1.41	---	---	---	---	---			
Torriorthents, south, south aspects	0-20	---	---	35-55	1.15-1.30	0.42-1.40	0.02-0.13	3.0-6.0	0.0-0.5	.10	.32	1	6	48
	20-24	---	---	---	---	0.00-1.41	---	---	---	---	---			
	24-28	---	---	---	---	0.00-0.42	---	---	---	---	---			
Haplogypsids	0-2	---	---	20-35	1.20-1.40	4.23-14.11	0.12-0.16	3.0-5.9	0.5-1.0	.20	.20	5	4L	86
	2-10	---	---	10-45	1.10-1.50	0.42-42.34	0.06-0.18	0.0-8.9	0.5-1.0	.28	.28			
	10-59	---	---	10-35	1.25-1.40	4.23-14.11	0.04-0.13	0.0-2.9	0.0-0.5	.24	.24			
	59-63	---	---	---	---	0.00-1.41	---	---	---	---	---			
GaC:														
Medburn	0-8	---	---	5-15	1.25-1.45	14.11-42.34	0.11-0.15	0.0-2.9	1.0-2.0	.32	.32	5	3	86
	8-60	---	---	5-18	1.20-1.45	14.11-42.34	0.08-0.18	0.0-2.9	0.0-1.0	.32	.32			
Glenwood	0-5	---	---	8-20	1.25-1.40	14.11-42.34	0.10-0.14	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	5-19	---	---	10-18	1.15-1.40	14.11-42.34	0.10-0.17	0.0-2.9	0.5-1.5	.37	.37			
	19-26	---	---	0-6	1.45-1.60	42.34-705.00	0.05-0.10	0.0-2.9	0.0-0.5	.28	.28			
	26-60	---	---	0-5	1.45-1.60	141.00-705.00	0.02-0.05	0.0-2.9	0.0-0.5	.02	.05			
GP:														
Pits	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Physical Soil Properties

Sevier County Area, Utah

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
MfC:														
Mellor, slightly saline	0-7	---	---	20-27	1.10-1.25	4.23-14.11	0.15-0.20	3.0-5.9	1.0-2.0	.49	.49	2	4L	86
	7-16	---	---	27-35	1.10-1.40	0.42-1.41	0.02-0.17	3.0-5.9	0.5-1.0	.43	.43			
	16-40	---	---	27-45	1.10-1.30	0.01-1.41	0.02-0.13	6.0-8.9	0.5-1.0	.43	.43			
	40-60	---	---	15-27	1.15-1.45	1.41-4.23	0.02-0.13	3.0-5.9	0.0-0.5	.55	.55			
NaB:														
Naser	0-10	---	---	15-27	1.10-1.25	4.23-14.11	0.17-0.21	0.0-2.9	1.0-2.0	.49	.49	5	4L	86
	10-60	---	---	18-27	1.10-1.45	4.23-14.11	0.14-0.20	0.0-2.9	0.0-1.0	.49	.49			
OTE:														
Tosser	0-4	---	---	5-10	1.15-1.50	14.11-42.34	0.04-0.09	0.0-2.9	1.0-2.0	.05	.17	4	6	48
	4-10	---	---	10-17	1.30-1.50	14.11-42.34	0.09-0.13	0.0-2.9	0.5-1.0	.17	.24			
	10-23	---	---	2-10	1.40-1.60	42.34-141.14	0.03-0.05	0.0-2.9	0.0-1.0	.05	.15			
	23-37	---	---	2-10	1.40-1.60	42.34-705.00	0.02-0.05	0.0-2.9	0.0-1.0	.02	.15			
	37-60	---	---	2-10	1.40-1.60	14.11-705.00	0.02-0.05	0.0-2.9	0.0-1.0	.10	.15			
Hiko Peak	0-9	---	---	10-18	1.25-1.45	14.11-42.34	0.04-0.09	0.0-2.9	1.0-2.0	.05	.20	5	6	48
	9-33	---	---	5-18	1.20-1.50	14.11-42.34	0.03-0.11	0.0-2.9	0.5-1.0	.05	.20			
	33-60	---	---	5-18	1.25-1.50	14.11-42.34	0.03-0.11	0.0-2.9	0.0-0.5	.05	.24			
Annabella	0-3	---	---	7-20	1.25-1.45	14.11-42.34	0.04-0.09	0.0-2.9	1.0-2.0	.05	.15	5	5	56
	3-60	---	---	7-20	1.30-1.60	14.11-42.34	0.03-0.11	0.0-2.9	0.0-0.5	.05	.24			
RaC:														
Rapho	0-4	---	---	10-25	1.15-1.35	4.23-14.11	0.13-0.18	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	4-59	---	---	8-18	1.20-1.50	14.11-42.34	0.07-0.15	0.0-2.9	0.5-1.0	.15	.24			
Naser	0-10	---	---	15-27	1.15-1.35	4.23-14.11	0.14-0.18	0.0-2.9	1.0-2.0	.49	.49	5	4L	86
	10-60	---	---	18-27	1.10-1.45	4.23-14.11	0.14-0.20	0.0-2.9	0.0-1.0	.49	.49			

Engineering Properties

Sevier County Area, Utah

[Absence of an entry indicates that the data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
B1:												
Torriorthents, north, north aspects	0-13	Channery loam	CL, GC	A-4, A-6	0-2	8-19	69-82	68-81	59-80	42-60	25-36	8-15
	13-37	Channery loam, parachannery clay loam, very parachannery sandy clay loam, sandy clay loam	CL, GC, SC	A-2, A-6, A-7	0	0-24	51-100	48-100	37-97	19-60	26-43	8-21
	37-41	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Torriorthents, south, south aspects	0-20	Very channery clay, very channery silty clay, very channery silty clay loam	CH, GC	A-2, A-7	0-1	17-26	41-58	39-57	35-57	33-57	44-63	22-40
	20-24	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	24-28	Bedrock	---	---	---	---	---	---	---	---	---	---
Haplogypsids	0-2	Sandy clay loam	CL, SC	A-6, A-7	0	0-6	88-100	87-100	71-97	39-60	30-47	11-25
	2-10	Clay, gravelly sandy loam, loam	CH, CL, SC-SM	A-4, A-7	0	0-6	87-100	87-100	54-98	39-80	21-57	4-33
	10-59	Parachannery loam, very parachannery loam, very parachannery sandy clay loam	CL, SC, SC-SM	A-2, A-6, A-7	0	0-3	94-100	85-100	60-96	29-59	21-43	4-21
	59-63	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
GaC:												
Medburn	0-8	Fine sandy loam	CL, SC-SM, SM	A-2-4, A-4	0	0	83-100	74-100	66-99	31-52	18-31	2-10
	8-60	Fine sandy loam, gravelly loam, loam, sandy loam	SC, SC-SM, SM	A-2-4, A-4, A-6	0	0-15	62-100	60-100	51-98	22-50	16-31	2-12

Engineering Properties

Sevier County Area, Utah

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
GaC:												
Glenwood	0-5	Fine sandy loam	CL, SC-SM	A-4, A-6	0	0	91-100	82-100	75-100	37-57	21-34	4-12
	5-19	Fine sandy loam, loam, very fine sandy loam	CL, SC-SM	A-2-4, A-4, A-6	0	0	91-100	73-100	70-100	33-53	21-31	6-11
	19-26	Fine sand, loamy fine sand, sand	SM	A-2-4	0	0	92-100	77-100	71-98	21-34	0-19	NP-3
	26-60	Very gravelly coarse sand, very gravelly loamy sand, extremely gravelly sand	GP	A-1-a	0	0-17	44-53	27-46	11-21	1-4	0-19	NP-2
GP:												
Pits	---	---	---	---	---	---	---	---	---	---	---	---
MfC:												
Mellor, slightly saline	0-7	Silt loam	CL	A-6, A-7	0	0	100	100	96-100	92-99	31-41	13-19
	7-16	Clay loam, silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	91-99	36-47	16-25
	16-40	Silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	91-100	85-100	36-52	16-29
	40-60	Silt loam, very fine sandy loam	CL	A-4, A-6	0	0	100	100	95-100	88-100	26-36	8-15
NaB:												
Naser	0-10	Silt loam	CL, CL-ML	A-4	0	0	100	100	93-100	86-98	21-30	6-10
	10-60	Loam, silt loam, very fine sandy loam	CL, CL-ML	A-4	0	0	100	100	95-100	91-100	23-30	7-10

Engineering Properties

Sevier County Area, Utah

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
OTE:												
Tosser	0-4	Very gravelly sandy loam	GC-GM, GW-GM	A-1	0	0	42-48	23-46	17-36	8-18	18-26	2-6
	4-10	Gravelly fine sandy loam	SC, SC-SM	A-1, A-2	0	0	66-75	46-75	41-72	17-32	21-30	6-11
	10-23	Very gravelly loamy sand	GC-GM, GW-GM, SM	A-1	0	0	48-59	26-51	19-43	7-18	0-21	NP-4
	23-37	Very cobbly loamy sand, very cobbly sand, extremely gravelly loamy sand, extremely gravelly sand	GP, GP-GC, GW	A-1	0	0-38	33-49	12-36	9-30	1-6	0-21	NP-4
	37-60	Very cobbly loamy sand, very cobbly sand, very gravelly loamy sand, extremely gravelly sand	GC-GM, GM, GW-GM	A-1	0	0-40	42-57	19-50	14-42	5-17	0-21	NP-4
Hiko Peak	0-9	Very cobbly sandy loam	SC, SC-SM	A-1, A-2	0	29-49	60-77	40-77	29-62	14-33	21-33	4-12
	9-33	Very cobbly loam, extremely cobbly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam	GC-GM, GW-GM, SC	A-1, A-2	0	22-41	36-72	22-62	15-50	7-27	16-28	2-9
	33-60	Very cobbly loam, extremely cobbly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam	GC-GM, GW-GM, SC	A-1, A-2	0	22-41	36-72	22-62	15-50	7-27	16-33	2-12
Annabella	0-3	Very cobbly sandy loam	SC, SM	A-1, A-2	0-12	22-31	70-88	40-77	29-64	13-35	20-35	3-12
	3-60	Very cobbly coarse sand, very cobbly loamy sand, very gravelly loam, very gravelly sandy loam	GC	A-1, A-2	0-6	0-30	41-50	28-50	20-41	9-23	18-32	3-12

Ref. – R647-4-113

Replacement Page 15

RECLAMATION SURETY ESTIMATE - D8R
OPERATOR NAME WESTERN CLAY CO.
Mine Name BENTONITE PIT
DOGM file Number M/041/0012
Prepared by Utah State Division of Oil, Gas & Mining

last revision 3/26/2009
file: MINE-BOND.xls
page "estimate D8"
County, SEVIER

PASSWORD
doug

Reclamation Details

1/20/10

Note: actual unit costs may vary according to site conditions — **last unit cost update 10/25/06**

-Amount of disturbed area which will receive reclamation treatments = 0 **acres**

-Estimated total disturbed area for this mine = 0 **acres**

Activity	Quantity	Units	$/unit	$
Safety gates, signs, etc (mtls & installation)	SIGNS, BOUNDRY POSTS AND 2 FUEL TANKS	1	600	600
Demolition of buildings & facilities	NO BUILDINGS OR FACILITIES	CF	0.33	#VALUE!
Debris & equipment removal - trucking	NO DEBRIS OR EQUIPMENT	trips	63.00	#VALUE!
Debris & equipment removal - dump fees	NO DUMP FEES	ton	110.00	#VALUE!
Debris & equipment removal - loading trucks w/FE loader	NO TRUCK LOADING	hour	245.50	#VALUE!
Demolition & debris removal - general labor	NO LABOR FOR THIS CATEGORY	hour	49.00	#VALUE!
Regrading facilities areas - D8R (2ft depth)	NO FACILITIES TO REDRADE	acre	1463.00	#VALUE!
Regrading - D8R dozer COST PER HOUR	NOT APPLICABLE	hour	233.00	#VALUE!
Regrading waste dump slopes - D8R dozer	OVERBURDEN OR WASTE ARE PUT BACK IN PITS		0.77	#VALUE!
Ripping waste dump tops - D8R dozer	NO WASTE DUMP TOPS	acre	361.00	#VALUE!
Ripping stockpile & compacted areas - D8R dozer	STOCKPILE, DRYING PADS AND TOP SOIL AREA= 14.5	acre	361.00	5235
Ripping pit floors - D8R dozer,	PITS ARE FILLED IN	acre	361.00	#VALUE!
Ripping pit access roads - D8R dozer (2ft depth)	1.1	acre	682.00	750
Ripping - D8R dozer COST PER HOUR	4	hour	361.00	1444
Creating safety berms or barriers around highwalls -D8R	HIGHWALLS WILL BE SLOPED OFF	LF	0.22	#VALUE!
Ripping access roads- D8R dozer	COVERED ABOVE	acre	361.00	#VALUE!
Regrading access roads - D8R dozer	1.1	acre	697.18	767
Sidecast mtl replacement of steep slopes - trackhoe	NOT APPLICABLE	LF	1.26	#VALUE!
Sidecast mtl replacement- trackhoe COST PER HOUR	NOT APPLICABLE	hour	378.00	#VALUE!
Surface drainage restoration or construction	NONE	LF	0.23	#VALUE!
OVERBURDEN FOR PIT FILLING	214,795	CY	0.77	165392
Topsoil replacement - D8R dozer	28,500	CY	0.77	21945
Topsoil replacement - scraper	NOT APPLICABLE	CY	1.39	#VALUE!
Topsoil replacement - scraper COST PER HOUR	NOT APPLICABLE	hour	446.00	#VALUE!
Topsoil replacement - truck only, 2 mi round trip	NOT APPLICABLE	CY	3.27	#VALUE!
Topsoil replacement - loading trucks - FE loader	NOT APPLICABLE	CY	0.56	#VALUE!
Topsoil replacement - FE loader COST PER HOUR	NOT APPLICABLE	hour	176.33	#VALUE!
Mulching (2 ton/acre alfalfa/straw)	NOT APPICABLE	acre	400.00	#VALUE!
Fertilizing (100 lb/acre diammonium phosphate)	NOT APPLICABLE	acre	100.00	#VALUE!
Composted manure (10 ton/acre)	33.6	acre	350.00	11760
Broadcast seeding	33.6	acre	280.00	9408
Drill Seeding	NOT APPLICABLE	acre	280.00	#VALUE!
Hydroseeding	NOT APPLICABLE	acre	930.00	#VALUE!
General site cleanup & trash removal	0	acre	100.00	0
Equipment mobilization	0	equip	3000	0
		Subtotal		217631
Reclamation supervision -10% of reclamation estimate				21763
		Subtotal		239394
10% Contingency				23939
		Subtotal		263334
Escalate for 5 years at 3.20% per year				44918
		Total		308251
Rounded surety amount in year 2011 $				**$308,300**